by the
AUTHOR.

COLOR IMAGES IN THE BRAIN;

BEING an account of the detection of Visible Objects, seen posited on exchanged sides in the Brain, after the intromission of impressions of light, reflected from external objects, one in each eye:—a description of which facts formed the substance of a paper read to the Royal Society at their last meeting;—of which paper, the Society has printed an Abstract;—the present print being intended as a Supplement to the previously-published RATIONALE OF THE LAWS OF CEREBRAL VISION: —BY JOHN FEARN, ESQ. — London: Published by Messrs. Longman and Co., and Rowland Hunter.

INTRODUCTORY STATEMENT

Of the first reception of the fact of Color Images in the Brain, in England: involving remarks on the Change induced on the State of Philosophy by the detection of that fact.

EVERY reader, either of the present Paper, or of the Rationale which preceded it, except those who are intimate with philosophy, will at first suppose that he is only going to be introduced to a new stage of the *Physiology of Vision*. But every reader, of the least liberal education, will be satisfied, before he get through this Preface, that the detection of Color Images in the Brain is not only a stage in the physiology of Vision, *and of the Brain;* but it is also a test, which exhibits to *ordinary* cognisance the final collision of two of the most comprehensive philosophies that ever divided the opinions, and affected the weal, of mankind—namely—the Philosophy of Newton, and that which has held it in ridicule,—an assertion which, be it observed,

I here make with regard to every reader considered as a juryman upon the *mere matter of fact;* without requiring any knowledge, or consideration, of the *philosophical bearings* of that fact. At the same time, it is here intimated, to the *philosophical anatomist and physiologist of the brain,* that a field is opened to his research, where the present paper leaves off: concerning which, more may be hinted in the sequel, but must be postponed, at present, to immediate considerations. In this place is merely called to his recollection, the optical approbation and celebrity which followed, (and not unduly so,) the discovery of *seeing a pin's-head double, with one eye:* which fact, neither the discoverer of it, nor any of his commentators, ever discovered to be a fact of *recrossed vision;* and which, therefore, has remained an insular and sterile fact; whereas, the demonstration of the recrossing in question is now laid out, in Prop. 21 of the Rationale, and illustrated by the Figures 3, 4, and 5, in the first Plate in that work: And, then, let him mark the character of the first reception which has been given, in England, to the detection of Color Images recrossed in the Brain; although the disclosure did not come to the public by gradual approaches, but all at once, including all the Dioptrical Propositions which *preceded, and led to,* the detection of the ocular demonstrations; for, not one of these detections of phenomena was *stumbled upon.*

This appeal is made in the full confidence, that there is liberality enough in the English Press, to insure justice on its merits; especially noticing, that the present Supplement differs from the Rationale, in this: that it *demands no knowledge of Optics, or Science,* to enable every Gentleman, of the least liberal education, to pronounce, *on his own judgment,* on the facts, from a bare inspection of the Figures given in the annexed Plate for illustration.

It is one of the peculiarities of this appeal, to impute no active wrong, in any quarter: because there certainly is neither any contradiction, nor any *tangible* opposition, to be

overcome. But it is a melancholy sign of the times, when Scientific Institutions, and Literary Associations, are multiplying around us, with the profession, and doubtless the intention, of most liberal, not to say noble encouragement and protection to the labors of knowledge, to find that, both Science and its Votary, even when the latter is of no pauper class, (if he put his trust in mere insular labor, unlinked to the interests of an associated body,) may find a common grave in an oppression for which, for *all that he* can say, *nobody* is to blame!

Secured by testimony, beyond any attempt at denial, from authorities* to which intentional injustice in my favor will never be imputed, that I have fully established my claim to a place in more than one department of the science of the country; and that, my labors, owing to their being not open to popular, or mere literary adjudication, have been barred up, even from the scientific world, by causes very extraordinary, and undeniably oppressive, but chiefly by exclusion from the leading channels which convey to Europe the various contributions of science; I hope I have established also another claim, in an appeal to English feeling, by the length of time during which I have persevered, in the face of such obstruction, until the evening of life has closed in, and threatens to terminate the struggle.

Before I narrate the fact of the non-recognition, in scientific quarters, of a contribution to PHYSICAL science in

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* MONTHLY REVIEW, in its analyses, and remarks on my pneumatological writings, often, and especially in its notice of the Rationale, Sept. 1831;—effectively, also, in the close of its remarks on the Parriana, Sept. 1828;—and, at large, back in Feb. 1822:—ARTICLE PHILOLOGY, in the *Cyclopædia Edinensis*:—Dr. Parr's estimate of the Essay on Immortality, published in the *Bibliotheca Parriana*: not to mention other instances.—It is for others to judge, whether the necessity for such testimonials at so late a day, is creditable to English philosophy. But, in case it be possible that I must forego the prosecution of the research, to devote myself to the obtaining of justice; I cannot choose but cry out upon the apathy with which the country has looked upon the happening of it.

the case of the Rationale; it may be proper to signify, that the immediate object, to be desired, is to have the matter sufficiently called to the attention of the *Continental* Philosophers: From whom, perhaps, the first effectual operation of it may return, in a reaction—perhaps dexter—*perhaps sinister*—to the Country from whence it emanated! Such is the state and prospect of the subject at present: Though it is not to be doubted, but there are enlightened individuals enough in the Country (if the matter be once brought to their knowledge,) to estimate the degree of credit which such a reaction would reflect upon that country.

The description of Visual Phenomena, now submitted to the press, has been withheld from publication during twelve months, owing to my having, in the first instance, presented to the Royal Society so unlooked-for a proof of the truth of Sir Isaac Newton's belief, that *Color Images, during vision, exist in the Brain.* And the same cause has induced me to delay the sending of the previously-published Rationale, (of which the present Supplement will henceforward form, by far, the most popular, or obvious feature,) to its intended special destination, as expressed therein, in my address to the French Philosophers. The substance of this paper, therefore, was read to the Society, at their last meeting, in June, under the designation of "*Recrossed Vision.*"—And considering that, I suppose, several hundred Papers were presented; it was perhaps rendering full justice to the case that mine was one of those read. Nor shall I, upon mere conjecture, affirm that, in the existing tide of contributions to science, there were not a dozen papers bearing more immediately upon pressing subjects than mine. I am, also, the more disposed to acquiesce, as the Royal Society has caused an Abstract of the paper to be printed: although it is manifest that *any abstract, however effective,* could convey the subject only to a small portion of the scientific world, leaving it locked up from the community at large. I had,

indeed, confidently reckoned upon *some* recognition of the subject; because several of the Fellows of the Society, besides other persons, had *witnessed* the phenomena: and, accordingly, I have to acknowledge, a recognition has thus appeared. The nature of it, however, demands my farther notice at the end of this print: but here I proceed.

Copies of the Rationale were sent to the Royal Institution, and to the Editor of its Journal.—Since then, there have appeared, in its succeeding Journals, two Papers, illustrated by Plates with very numerous figures, on *Foreign* contributions of Ocular Phenomena: In no part of which Journals is the most distant suspicion hinted of any such thing as *recrossed vision, or color images in the brain;* nor any, the least, tendency toward such a discovery. And yet, I believe, so much as the name of the Rationale is not to be found among the incidental notices afforded in their pages; although, indeed, I have to acknowledge the usual Letter of thanks, for the copy presented.

Copies were in like manner sent, *officially*, to Dr. Brewster, as Conductor of the "*Edinburgh Journal of Science*;" and to Dr. Lardner, as a Conductor of *Scientific Dictionaries*, and "*Libraries*," and *Professor of Natural Philosophy in the University of London;* besides a copy presented to that University. And all, I believe, with the same result that followed those sent to the Royal Institution. It remains for me now, therefore, to contrast this manifested deadly apathy on the subject, with the several manifestations of *vitality* to the interests of the *very same science,—the very same department of that science,* —by the *very same persons*:—of whom, however, I have no personal knowledge, nor any surmise of their active opposition to my views. In drawing this contrast, I give notice that it will involve the statement of considerations, to the last degree important to the fate of philosophy: of which, I have no doubt of receiving the assent of every reader in the least degree competent to the subject. The

statement of the case, therefore, is of an interest immeasurably greater than any consideration affecting either myself, or the other parties here immediately concerned. The great impending consideration, to which I now allude, is this:—The genius of Newton has, during nearly a century, undergone the last degree of pointed derision — whole pages of set and consecutive ridicule,—unanswered, I believe, by any writer,—for his believing that, during vision, *Color Images are called up in the Brain:* In other words, Newton has been held, *upon this positive statute of derision,* to be a *Philosopher of* BODY ONLY,—and NO PHILOSOPHER OF MIND.* But, What will be said, now that phenomena have been detected, which, in all their varieties, flash conviction, upon the learned, and the unlearned, that Newton will never more be ridiculed for believing that, during vision, color images exist in the brain? If there be ears in Europe that are open to the cries, or hopes, of true philosophy; one should think, they must be electrified by the communication of this fact; which, the incalculable moment of the matter demands should be repeated here, in the most impressive terms:— Therefore, I do repeat, (and this with a sense of the thing which I could not express,)—*No philosopher will ever again* place his reputation in the predicament of ridiculing the genius of Newton for believing that color images, during vision, exist in the brain: and this, for no less a reason than that *color images in the brain and recrossed vision are one and the same fact.* Those who are in the subject, and who therefore understand the fate in which this fact seals up not only the philosopher, *but also the* PHILOSOPHY, which ridiculed Newton, may conceive why the

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* For a matter upon which such consequences depend, See, in Reid's "INQUIRY INTO THE MIND,"—Chap. 6, Sec. 19th,—a raillery carried on with unsparing *pleasantry*, in pages 346,—7,—8,—9, and 10; until, at length, poor Newton, and his companion in disgrace Dr. Briggs, receive a dismissal from the fire of that battery, in the words—"*But to be serious.*"

apathy, if not the antipathy, of many persons should meet the detection of recrossed vision. But, now for the contrast, above proposed.

On two different sides of the *Times Journal*, for September 3, 1831, there are extracts from *Dr. Brewster's Life of Newton*, in the "*Family Library*:" in one of which, he says—"The modesty of Newton, in reference to "his great discoveries, was not founded on any indiffe- "rence to the fame which they conferred, or upon any "erroneous judgment of their importance to science."—And, then, with allusion to a simile of Newton's on this topic, equally modest and beautiful, Dr. B—— exclaims—"What a lesson to the vanity and presumption of philo- "sophers,—to those especially who have never even found "the '*smoother pebble*,' or the '*prettier shell!*'" The aid thus afforded in the *Times Journal* to the Work in question, or to any such Work, is liberal, and fair. Nor do I anticipate that the *Times* will hold back its vast power of doing justice, from such a cause as that now at issue. But, with reference to the just moralising of Dr. Brewster, I ask; Will he stand up, and under his name deny that recrossed vision is *one of those smooth pebbles, or curious shells, which Newton would delight to have handled*; as is proved by his *recorded experiments on the Optic Nerves, in attempts to solve the problem of erect, or cerebral vision?* Or, Will Dr. Brewster deny that the fact of recrossed vision is *completely established, even in the Rationale, upon ocular demonstration*, in the case of our *seeing the recrossed peacock's feathers*, when we press both eyes simultaneously, as is illustrated in the Second Plate, in the Rationale; that is, I say, *established antecedently to the fact's being recognised by the Royal Society*, in their Abstract, already noticed? But, if Dr. Brewster will not place himself in the situation of denying this; Might it not, then, have been expected that, in his character of an Optical philosopher, he would have spoken out, on the occasion of an advance in optical science which, I have shewn, has

determined for ever the fate of a most pretending and very influential philosophy: and which result he must, as an Edinburgh philosopher, well know, (whether or not it can be delayed,) cannot be averted, on whichever side he may happen to sympathise. This question, also, comes with the more force when I state that, in a very remarkable foot note in the Rationale, I expressed my expectation that Dr. Brewster and Dr. Lardner, whom I therein complimented as eminent optical professors, would, in their office, afford their recognition to the matter.

The case is made far stronger by the silence of Dr. Lardner. And it is of very material moment to contrast, here, his non-recognition of the subject, with what he has most conspicuously expressed of *Newton's Philosophy of Mind,* in a quotation at the close of Dr. Lardner's account of Newton's Optics, in the "*Library of Useful Knowledge.*" The passage in question exhibits the language, *and the Creed,* of Newton with regard to the nature of Mind,—a Creed which must carry conviction, to the most ordinary reader, that Newton's Philosophy of Mind is indisputably established by the facts of recrossed vision,—a creed, therefore, which, if I have not lamentably mistaken the bubble-evanescence of chimeras, for the stable utility of philosophy, deserves, for its incalculable moment, to be written on every hand,—especially since every one, who does not himself understand the problem, may be assured that Newton's Philosophy of Mind is vital to the happiness, and the hopes, of mankind. The quotation, which does so much credit to Dr. Lardner's judgment for having *deemed it the best which he could select in order to close his account of the Optics of Newton,* runs thus,—"And these things being "rightly despatched, does it not appear from the pheno- "mena that there is a being, incorporeal, living, intelligent, "omnipresent, who, in infinite space as it were in his sen- "sory, sees the things themselves, intimately and tho- "roughly perceives them, of which things THE IMAGES "ONLY, carried through the organs of sense into our little

" sensoriums, are there seen and beheld by that which in " us perceives and thinks."

Here I put it, to the philosophers of every country, whether it will be in the power, even of prejudice, for a moment to deny that the truth of this Creed of Newton is *realised*, with the most conclusive certainty, by the fact of color images called up, during vision, in the brain, as witnessed in the phenomena described, and illustrated by the Figures, in the Plate supplied to this Paper? Or, rather, I may repeat, on account of its great moment, what no one will deny, that the *creed of Newton and recrossed vision are one and the same thing.*—Might it not, then, have been expected that Dr. Lardner would have been forward to bear testimony, and give his support, to a realisation so important to philosophy, as well as vindicatory of the genius of Newton?—Shall I suppose that he does *not know* that Newton has been held, (as I have said,) a *beacon and a by-word,*—by the founders and advocates of the opposite philosophy, for his belief in color images? And, if he *does* know this; Can I suppose that he, or any man of name in the present day, will desire, when the subject shall become matter of history, to have it imputed to his memory that he looked on, and saw the realisation of Newton's conjecture, with all its incalculable consequences, struggling into parturition; and, yet, denied it respiration?

And here, in alluding to men of name, the subject imperatively requires that I turn from Optical Philosophers, to *Metaphysicians.*—There is one name, at least, in the Country that has long been eminent for tact, and knowledge, of the different metaphysical theories which now compete for predominance in the world; though I am to suppose that the distinguished individual, who bears it, is altogether unacquainted with the existence of my views, and therefore of the present struggle: to whom, from not being better informed, I should incline to attribute some recent papers on the theories of the Continental Writers, and in advocation of the Reideian philosophy, published in

the EDINBURGH REVIEW:—I mean, Sir James Mackintosh.—And here I claim of him, on public ground, and public right, (*it cannot be fit I should supplicate,*—I appeal on *no abject—no inferior* ground,—I honor; but, pressed upon it, I ask, What friend would advise me to exchange philosophical labors with him?)—most earnestly, and solemnly;—or the wheel be broken at the cistern,—and while the great and the little,—the noble and the ignoble,—the man who lives for present, or dies for future fame,—in a word, every man now living who owes, with me, a responsibility for whatever talent he possesses, is verging to that goal which forecloses all power of earthly justice, and brings man into account with his Creator; that he do, in some manner adequate to the occasion, declare,—*as a* SCOTCH METAPHYSICIAN, — IF,— OR HOW, — *he can* DISPOSE of *Color Images in the Brain!* — But, if Sir James will not do this: then, under the revolting injustice of the case, I am urged to say;—Let him, for the moment,—(and I suppose no man better may,)—represent not only the philosophy, but also both the manly feeling and the scientific pride of the Country; and answer, —In England, which boasts her moral distinction above the nations, Shall a man who, for twenty years, has been *acknowledged* to have *shewn cause* against the Scotch Philosophy,—whose speculations on the philosophy of Language are a theme in a *Scotch Cyclopædia,*—and who now presents, (in the completed Rationale,) not a problem, but a new *Science comprehending many problems, that were experimentally sought by Newton,*—Shall he, only because he has worked ungraduated, unmatriculated, and unharnessed to the courting of influential men, be treated like a dealer in *contraband;* and die a victim to a proscription which will fill future men with astonishment?—Am I, then, a sacrifice to *mere apathy—the mere philosophical apathy of the country?* Or, are there no private sympathies, and jealousies too, concerned in the doing of it?

Note.—As men of liberal minds naturally take an interest in any important subject which they *understand;* it is here explained that — If a spectator

COLOR IMAGES IN THE BRAIN.

Of the immediate bearings of Philosophy upon the Political and Domestic affairs of mankind.

It is the known result of research, frequently to show us connexions between subjects of knowledge, in their several natures apparently the most distant from each other. The occurrence of Color Images, or in other words Visible Objects, detected in the head, affords one of the most remarkable, as well as important, examples of this fact. And, hence the interest demanded by the following sketch of an existing and indubitable state of co-incident circumstances.

The known *inconsistency* of the Human Intellect is one of the most mischievous of its defects. And, in no case does it operate *so extensively*, in its mischief, as in that for present consideration. Within the memory of those who are still living, England has paid, besides a vast amount of blood, and tears, the better half of a thousand millions of her money, as her attesting signature to the fact, that PHILOSOPHY can carry spoliation, or misery, to every fire-side in Europe: AND, YET, Englishmen—educated and enlightened Englishmen,—almost one and all,—maintain a fatal apathy, if not a contempt, for the very Name of PHILO-

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place his two eyes within an inch, or two, of the *two half faces* in the Plate, (*Fig.* 7;) he must inevitably see the two halves *transposed*, and *reformed*, into a *proper whole face*. And most persons, also, can see a similar result, from a mere inspection of the other figures in the plate.

Now the bare enunciation of this fact, as witnessed by any gentleman in the conduct of a Literary Journal, or Periodical of Criticism, may compensate for any silence of scientific reports, and essentially serve the subject, by conveying, to philosophers of every country, a hint which, *they will discover, involves all the consequences in question.* It is herein that the general Press can *command* justice to be done. It is not that there is the *least demur* to the reality of the fact, or that it requires *confirmation.* The only evil is,—How should Europe,—or, even, How *should England*, otherwise KNOW the fact, when I have shown that the Scientific Authorities have *agreed*, (I do not say *conspired*,) in the determination of not letting it come through their channels?

SOPHY, *under an inveterate belief that it has no immediate bearing upon the affairs of life!*

I must not be understood, here, as imputing to philosophy the reactions which have convulsed and appalled Europe in our own times: because, there can be no doubt, but men of ordinary understanding, ordinarily informed, under suffering from misrule, might have proceeded to the same reactions. But I stand here upon the fact, which no one can deny to me, that *a Philosophy,—the "Philosophy of Nature," involving the Creed of Eternal Sleep,—generated a Spirit,* which rendered those reactions *unnecessarily horrible;* and, also, rendered the nerves which it actuated *more desperately energetic* in conquest, and in mischief. Nor can it be pretended that the spirit of the creed of eternal sleep either *has been,* or *is likely to be,* laid by that of the British Philosophy which, *if it were only founded in truth, or at all commanding the respect of the Men of "Nature,"* might certainly have led to better things. The Philosophy of Scotland has been laboring, to exorcise the fell spirit of Atheism, during a period approaching to a century! Has it made any progress in this holy work? Let the question be answered by the most accomplished, most dignified, and most influential writer of the Scottish School. And, assuredly, reflecting minds must be impressed with the evidence which such a witness bears, unintentionally, against his own cause. The late Professor Stewart of Edinburgh, in that Work on Morals which, it may be said, he bequeathed to the world almost in the article of death, has expressed himself on this question as follows. And the value of the confession I conceive to be almost incalculable, if mankind will only avail themselves of the information, and the lesson, it holds up.

"From this time downward we may trace the rise and "progress of that disposition to '*persiflage,*' which has been "so long the characteristical of the higher orders in France, "and which, a few years ago, some individuals in our own "country were so ambitious to copy. In France it seems

" to have attained its greatest glory during the gay and un-
" principled period of the regency; and ever since it has
" left sensible effects, not only on the tone of fashionable
" society, but on the spirit of most philosophical theories.
" —The following Speech of Cleon in the *Méchant* is an
" invaluable document for the history of French manners,
" (now alas! too widely diffused all over the civilised world,)
" during the greater part of the eighteenth century."

Phil. of Morals, Vol. 1. *page* 212.

Of the importance which Mr. Stewart attached to the document, which he thus pathetically introduces, those, who have not seen it, may judge from the circumstance of his giving it not only in French, but in English also. And it is impossible for the least-sensitive reader, to contemplate the exquisitely-polished and adamantine profligacy, which issues from the mouth of Cleon as the *glass of fashion of the "higher orders;"* (wherein he finishes by exclaiming that,—" the only crime now known is *ennui*;")—without recognising, at once, the *philosophical workshop* in which that glass was manufactured. The fact, therefore, of the direct bearing of philosophy upon human manners, and happiness, as testified by the reflection of Mr. Stewart now under consideration, does not admit of a moment's denial.

Do I, then, intend to reproach the French Philosophers, with the Atheistical creed which has wrought these effects on society? Certainly not. Their creed was the result of *their view of the* DATA. And it is not by reproach, but by research, that any one can hope to change, or affect, their conclusion. I may, at the same time, put it here, for their consideration, that, in those four laws of Visual Perception (which I called the *Laws of Primary Vision*) formerly advanced; and, still farther, now, in the detection of Color Images in the Brain; they have *new data*, of a far different complexion from those upon which they proceeded. And I may well hope, (*from my own former belief in Matter,*) that, if once their attention be adequately

called to discern the connexion between Color Images in the Brain and the legitimate philosophical deduction of the *Spirituality of Mind* and of the *External World as a Mind involving, in its Infinite Volume, all finite minds ;* the result may prove the happiest, for the human species, that ever awaited philosophical speculation. But this consideration I have been led into incidentally, by the way. And I resume the previous topic.

If we but view the philosophy of Eternal Sleep, *only as an actuating political* principle, tending to set the men of one country upon war and spoliation of all around them; strangely inconsistent does it appear, with what apathy this principle has been beheld by ourselves, although the fact is within our memory that it had, once, well nigh led to the subjugation of Britain herself, into a province, and a handmaid of an invader. If, instead of building a *philosophy,* the hostile nation which threatened her had built a *navy,* with intent to the conquest ; What would England, then, have done?—*Looked on with apathy?—No such thing.*—She would instantly have built *an opposing navy, of adequate power to her defence.* Why, then, should she act differently, when the danger *has been, and may again be,* equally great; not, indeed, from a navy; but from a philosophical creed ?

But, dropping here the *political* bearing of the subject; because, in fact, it is *by far the least important* consideration before us; Let us, now, revert to the *domestic;* to which we have already been introduced by the moral reflection of Professor Stewart. It is not, then, *as an open—a political or national foe,* but *as a profess domestic friend,* that mankind have most deeply to fear the philosophy of *eternal sleep.* At a stage of the *advancement* of society, in which, no gentleman, or lady, of the higher, *or of the lower* orders, can enter her *social circle,* except to meet the stigma of *lost cast,* unless she has travelled to the Continent, and for a due season inhaled the *effluvia* of "*persiflage ;*" Can any one doubt that young and ductile

minds, so enlightened, must contract, and bring home, *a smack of atheistical enlargement of their understandings?* And, Can it be doubted what effect this MUST *have;* —nay, what effect it *has had;* upon the mass of society in Britain? I might pursue this consideration, with melancholy truth, to a far greater extent. And, indeed, I might ask—To how many firesides *has it not* in reality been carried. But the delineation of it cannot be necessary here, since the proof of the fact is already too complete. At the same time, however, I may remark that *many persons* appear to suppose that the bulk of mankind is made up of *believers*, and *unbelievers*, and a *few fixed sceptics.* But they have not reflected deeply, who have not discovered that, a large proportion of society consists of persons, (especially those who have travelled, and have undergone a shaking fit from the *malaria of persiflage,*)—who *ever after librate,* between belief and atheism; and usually oscillate to the *latter when they either act or deliberate;* though, in returning to the former, they may regret.

It must not be mistaken, to suppose, that my intent, or object herein, is to *moralise.* It was Professor Stewart only, and that very appropriately, whose object it was to moralise, in the reflection which I have quoted from him. My intention, on the contrary, is *merely to assert and prove a fact*—namely—that of the *direct bearing of philosophy upon human affairs, both political and domestic;* and of the *wonderful inconsistency of intellect with which this fact is overlooked in England.* And, I suppose, no such fact could be more certainly, or pressingly, made out.

In fine, then, I would impressively call to general attention the following remarks. The Philosophy of Scotland *is sublime:*—But it is a *sublime vision,* founded in mistakes; the happening of which, nothing but their history —(given elsewhere)—could render credible. And, besides its *visionary essence,* it is professly embarked in the same bottom with the belief in MATTER—the fulcrum and foun-

dation of all atheism,—a belief which, *its advocates own*, has no other than a *natural prejudice of untaught man for its voucher*—namely—that prejudice by which, when a clown strikes his foot against a stone, he confidently believes he touches *solid body*; while *all natural philosophers now know, and are agreed*, that he is deceived, and touches *nothing but* SOMETHING IMMATERIAL. At the same time, the Philosophy of Scotland, in point of *sublimity*, is as far beneath that which *explodes* MATTER, as a soap bubble is beneath that of the ORB whose rays render that bubble visible. From what I have now said, the Philosophy of Scotland *never has resisted*, and *never will* in the least degree *resist*, the torrent of atheistical opinion, in any country. And it is here, on the testimony of Professor Stewart himself, that it cannot, in the least degree stop that inundation of persiflage, which certainly, though silently, saps, and rots to the foundation, the *very pretence* to moral rectitude; which *pretence it proscribes* as being certain hypocrisy in the pretender: *For, such is* PERSIFLAGE.

But, *the existing case, which* NOW calls for examination, is this: The Scotch Philosophy,—thus impotent, and many times refuted, though refuted without its being listened to, is that *same* which ridiculed the Philosophy of Newton—ridiculed it upon the *vital assumption*—vital to the subject in question—that *Color Images could not exist in the brain*. And, I here repeat,—(and I could not repeat it too often for the sake of what impends,)—*No philosopher will, ever more, ridicule Newton for his belief in Color Images!* May it not, then, be expected that thinking men will, NOW, examine farther into the merits of Newton's Creed,—a creed which is identical with that of Locke; and, on the investigation of the problem which involves it, I may firmly believe, I have labored longer, and with more intensity, than any man now living, or perhaps than any man that ever lived; but which creed has, with a violation of truth altogether astonishing, been misstated as being the

same with that of the Ideas of Berkeley and of Aristotle? Of course, I do not affirm that there has, in that misstatement, been any *intention* to misrepresent: But it is strongly urged upon me to declare, at this stage of my speculative life, that the violation of truth, (supposing it to have been a mistake induced by *mere hasty prejudice*,) of the confounding of *Locke's "Ideas"* with the *"Ideal Theory,"* was perhaps one of the *most gross*, as it has certainly been one of the *most mischievous mistakes*, that ever disfigured the history of philosophy: And I have repeatedly cried out upon the enormity of that confounding; though *existing sympathies, apart from apathy, have hitherto been too strong* to let it be heard. Whether, or not, the Philosophers of France will effectually recognise the distinction which I now urge; I affirm, as being of the last moment to the subject, that the *so-called "Ideology"* of Locke would not be *more falsified* if men were to attribute to his "Ideas" the properties of *inertia, attraction, and repulsion*, than it would be by asserting that they have ANY AFFINITY to the *old scholastic or common ideal theory*.

WHAT REMAINS to be said here will be equally important, to some readers, with what has gone before.—Professor Stewart, in the outset of his *Elements of the Philosophy of the Mind*, has justly enumerated two general causes of the neglect of philosophy. One of these, is the consideration already here discussed. Of the other, I beg to say a few words.—It is believed, that the *objects of philosophy are beyond the reach of the human faculties*. And it must be admitted that such has proved to be the fact, in a very lamentable degree, in the history of the subject. But the question still remains: Is this a necessary, or inevitable, result of its research? And another question arises;—namely—Is there now in existence any fact, or evidence, which revives the hope of the subject?—In answer to this, I must recall to attention my assertion, here, with a view to the French Philosophers, that *there are*

new data, on which to proceed: On which data, my solution, (if such it be admitted,) of the problem has been wrought: and upon which, *their statement* of it must be *recast.* These are,—the *Laws of Primary Vision,* (some years before the public;)—and, now, *Color Images in the Brain.* How these data produce a desired result, I have fully explained elsewhere: and it forms no part of my present consideration. But it seems very material, here, to explain, in few words, the *difference,* the *affinity,* or the *identity,* (according to the views which we take of them,) of the two species of data here enumerated.

COLOR IMAGES, then, *including their Figures,* are the *matter* and the *form* of Vision, embodied together. Whereas, the FOUR LAWS OF VISION, are *only the Principles* upon which alone Color Images can exist. Color Images in the Brain are an *Optical and Physiological* subject; and the demonstration of their *recrossing and being rectified in the head* is parcel of that physiological subject. But the Laws of Vision are a PNEUMATOLOGICAL subject, (besides their being proved upon inductive evidence:)—They demonstrate *both the* FACT *and a* NECESSITY *of its law,* that Visible Figure is *a necessary result of the* MEETINGS OF OUR SENSATIONS of colors. And, thus, it is set at rest, upon this TWO-FOLD KIND of proof, that *Color Images in the Brain* are *Color Images* IN THE MIND, *in the Brain!*—Will any prejudice have force to keep philosophers, NOW, from investigating the problem upon these data?

In fine:—The laws of *Primary Vision,* being only laws of *our Sensations,* are laws of MIND ONLY; and they do not relate to the recrossing of visual impressions, nor to Cerebral Mechanism at all. But *Color Images* are *facts of Primary Vision;* and they are *formed by its laws.*—It only remains to caution readers, of every class, against an error which would, to the last degree, misrepresent the Structure here insisted on. Hence, I observe,—COLOR Images (which Locke and Newton would call

by the same name) *do not mean colored* images:—They do not mean the "*species*" of Aristotle, nor the "*ideas*" of Berkeley; neither do they mean *any things substantively different from the* MIND: On the contrary, they mean *occasional changes*,—i. e. MODIFICATIONS,—of the MIND ITSELF. *And this*, both Locke and Newton *asserted*, as legitimately as ever did Dr. Reid: though Newton, and Locke, sometimes also used the word "*species*,"—manifestly in the *same sense* that I employ "*color images*."

DESCRIPTION OF COLOR IMAGES IN THE BRAIN, MORE CRITICALLY DESIGNATED RECROSSED VISION.

THE PROXIMATE intention, in publishing the result of the following experiments for the production of Recrossed Visible Objects, being that of annexing them, as a Supplement, to my previously-published Rationale of Cerebral Vision, to which they refer, and of which they will now form virtually an integral part; it happens that several passages in the original paper presented to the Royal Society, of which the present statement exhibits in great part a literal extract, would in the existing case prove little better than redundant, inasmuch as the substance of those passages has very probably been expressed in the Rationale itself. Such parts of that paper, therefore, are omitted here: And those now printed are marked by inverted commas, in order to distinguish them from any additional observations which the present occasion has appeared to demand. The extract, next immediately following this, expresses the leading passage of the paper alluded to, after duly addressing it to the learned body above mentioned.

"Although no doubt has existed in the minds of Anatomists that the Optic Nerves and Brain are in some way or other instrumental in the process of Visual Perception;

it is sufficiently known that there is not a more complete blank in Physiology than that which ought to contain a rationale of Vision within the head. It appears indeed that, since the attempts made by Sir Isaac Newton and Dr. Briggs, to account anatomically for the fact of single and erect vision, the matter has been considered as being hopeless: because any subsequent endeavors to solve the problems in question have not, I believe, been projected upon Cerebral, or Physiological ground; but have proceeded upon some supposed *external* principles; with the exception, only, of the hypothesis of Bishop Berkeley, which assumes that the Mind or Judgment, under the domination of the Sense of Touch, reverses the sentence of the eyes, and makes us see images as erect, that are in reality inverted."

After some farther preliminary matter; in the course of which, I adverted to my having detected the curious fact of the *duplication of the nose, seen in recrossed images,* the *left-hand image-nose* being seen with the *right eye,* and the *right-hand image-nose* with the *left eye;* the Paper proceeds as follows.—"To describe, now, for the purpose in question, the phenomenon of the crossed and duplicated nose, as forming the initial fact under which I shall follow out the subject; I observe that, one or other, of the two seen images appears very faint and shadowy, especially upon its first detection. This fault, indeed, mends a little after practice; and, in particular, if we wave the head laterally, to and fro, during the experiment. But the phenomenon, at best, never exhibits any degree of elegance: although it is inferior to none as an indubitable ocular demonstration of the *recrossing,* as well as of the duplication, of the seen images. The initial fact being once detected, however; the consequence could not long remain hidden. And I had hardly any leisure to reflect upon it, after the Rationale had passed out of my hands, before it became evident that, in all probability, it would be possible, by employing artifice, to arrive at the most vivid and precise

phenomena of this class. Accordingly, I proceeded to try with a bit of white paper upon that side of the nose which, when seen recrossed, had appeared the most faint. And, after going through a course of experiments, which it would be tedious and of no utility to describe here, I found the following to be the most remarkable and fit to be recorded, as forming what I suppose may be considered the cardinal phenomena in the class of proofs in question."

"*Experiment* 1.—Having placed a gold coin on the left side of the nose, and a silver coin on the right side; both coins being placed near the lower end of the nose, and so situated that it was impossible to see the left-hand coin with the right eye—or the right-hand coin with the left eye; and managing the light so that each coin shone upon its respective eye, and the two coins so that the retinal image occasioned by each must fall upon the *outer side* of the retina as represented in the Plate, *Fig.* 1;—I saw the *yellow image-coin* ON THE RIGHT SIDE *of the white image-coin*, that is to say I saw the correlative places of the two coins *changed;* while, it is quite certain, I beheld the *left-hand image-coin* with the *right eye*, and the *right-hand image-coin* with the *left eye;* the nose being interposed, as it were a mountain, between the two eyes, and rendering any deception with regard to the fact impossible; while the *different colors* of the coins rendered the identification of each of them the most certain that could be imagined."

"*Experiment* 2.—In this Second Experiment, the introduction of motion produces the most striking results in the phenomena.—Holding a short, bright, metallic rod, about an inch and a half in length, horizontally, with the centre touching the point of the nose, *Fig.* 2; and, then, making the rod swing up and down, as if it librated on its centre; if we look at one arm of the rod with each eye, we shall perceive, in the most vivid and precise manner, that when the *right arm* of the rod moves down, we see an image-arm of it with the *right eye*, which image moves

down upon the left side ; and, at the same time, see another image-arm with the *left eye,* which arm moves *up upon the right side ;* the two librating image-arms thus exhibiting a most beautiful display of recrossed vision."

" Any substance, or color, whatever, may answer the purpose of a Librating Rod for the experiment; though a metallic lustre is the best adapted for it. It, moreover, requires very little intension of vision, or tact in the experimenter, to gain sight of this phenomenon. And, from the moment it first appears, we may contemplate it steadily for any length of time; and may see it while we move the rod to a considerable distance from the nose; the *two image-arms,* instead of being extended in a line like those of the external rod, *appearing folded towards each other* and either *touching,* or *interlacing,* at every succeeding libration."

" *Experiment* 3.—Holding a yellow coin in an inclined position, at the distance of an inch, or two, with its edge toward and in front of the left eye, so as to present the appearance of a short metallic rod, Fig. 3; and a white coin, in a position to form a right angle with the former, at the same distance in front of the right eye, *Fig.* 4; the two coins being nearly an inch asunder; and, then, looking at the two coins, one with each eye; I saw the two image-coins forming together a St. Andrew's cross, as represented by *Fig.* 5."

" It is to be remarked, that the images seen, in this case, are usually more readily discerned, than any of those in the experiments above described : and we can with the greatest ease, and continuance, remove the two objects to any distance from the eyes that our extended arms can reach, all the while continuing to behold the two image-objects crossed, as above described."

Now, as it is self-evident that the two real external coins, in this experiment, *do not cross* each other, *nor even so much as meet by the considerable distance of near an inch, or more ;* we have herein the highest degree of cer-

tainty that the *two crossed seen image-coins* exist thus crossed in the cerebral mass, behind the eyes, on the interior side of the cranium, in a region of the brain adapted, and an organ constructed, purposely for this union."

"*Experiment* 4.—Having conceived, in the outset of these experiments, that it ought to be practicable to reduce the proofs of the subject to the last degree of imaginable precision, by causing the Visual Mechanism within the head to operate so as to *transpose two words*, or *two syllables of one word*, and make the *first* syllable be read with the *right eye*, and the *last* with the *left eye* ;—thus making together *one word, rectified by the recrossing visual process;* I formed a little instrument of paper, which I call a *Cerebral Spectrum*, consisting of a slip of paper folded into a body and two wings, as represented, both in shape and size, by Fig. 6. And having written, on the *right wing* of this Spectrum, the syllable "CERE;" and, on the *left wing*, the syllable "BRAL;" and applying the body of the spectrum, as a saddle, over the nose, with one wing on each side of the nose, and inclined inward so that the syllable—"Cere"—lay on the right side of the nose, and the syllable—"bral"—on the left side; upon looking with both eyes, I experienced the anticipated satisfaction of seeing the two syllables transposed, and reformed, into the image-word "CEREBRAL."

"Perhaps it will be admitted that the elegance of this phenomenon surpasses that of all the others, and yields the most lively sensation of pleasure, in contemplating the proof it affords of the recrossing already so amply demonstrated. It may merely be added that, the effect is made the more perfect if we move the spectrum gradually away to some distance in front of the nose, after having once got sight of the image-word duly reformed. And I may farther suggest that, by proper artifice, *two half-sentences of considerable length*, might be made legible on the same principle ;—a fact which I tried with some success, though not with any additional satisfaction."

The Four Experiments, with their resulting phenomena, now described, are all that were stated in the Paper presented to the Royal Society. To these, I have here added the experiment of the *Two Half Faces* delineated on a card; the *Seen Images* of which are recrossed in the Brain and appear as a *Proper Whole Face*, the *Halves* being joined together by those sides of them which are farthest asunder on the card, which is the manifest and mathematical result of their having *changed sides in their local relation to each other*. On the present occasion, I have substituted, for a spectrum with a body and wings, *merely a Card with a Notch in it to serve as a nose-saddle;* which forms a simpler, and a more convenient, spectrum than the former as described in the original paper. The notch being placed on the extremity of the nose, and the card varied in position, and perhaps pushed forward *and downward in the line of the ridge of the nose, or lower;* the experimenter may gain a sight of the recrossed images at any distance within a foot, or more, of his face: because, until the card is *beyond that distance*, the impression of light from the two Half Faces, upon the bottoms of the eyes, continue to fall upon such *uncorresponding* parts, respectively, of the two retinæ, as occasion, *when recrossed in the brain*, a meeting of the Halves, in the manner displayed by the united images.

If the distance of the objects from the eyes were increased, beyond that mentioned above, the two retinal images (*i. e.* one in each eye) must *begin to coincide, or correspond;* and so, at length, if both eyes were equally effective, the two half faces would *club into one unmeaning mass*. It is owing to this dioptrical law that we are saved from seeing distant objects, preposterously, on exchanged sides: which would always happen if those objects were near the eyes, and in certain lines of bearing.

With regard to procuring proper *External Subjects*, for the described experiments; I may here intimate that, the *identical figures* on the Plate, given at the end of this pa-

per for illustration, are sufficiently adapted to the purpose. Thus, If the extremity of a spectator's nose be applied in contact with that of the sketched nose—Fig. I.—he may, with the least tact, see the two image-coins on exchanged sides, and may *read* the word *Silver*—and the word *Gold*, thus transposed.—And, if the end of the nose be applied between the *Two Half Faces*, in the *Notch* of the card; the spectator will, infallibly, see the *Halves transposed* into a *Proper Whole Face*. The Image-Objects, of course, *always appear as if they were upon the nose;* or, else, *in some other* EXTERNAL place. But every one, who has the least smattering of Optical Science, knows that they are *transposed in the Brain, and exist nowhere else;* their transposition *any where anterior* to the retinæ of the eyes being dioptrically impossible.

It may not be without its utility to hint, here, that, upon this Principle, those who may be interested in Optical, or Spectral amusements, may easily, by means of eye-tubes and other adapted adjuncts, produce a variety of changes in the relative situations of *Image-Objects:* all of which would prove curious; and some, in no small degree, ludicrous. Nor let it be thought that this hint is altogether puerile, or derogatory to the subject, unless any one will undertake to inform us, with certainty, that *no advance in Science* can ever result from the prosecution of such inventions. We need not go so far, as the alleged invention of the Telescope, to learn that, the conversion of a discovery into an amusement may lead to the conversion of an amusement into a discovery. The fact that, the Seen Images of any two external objects, duly depicted on a card, *are not only seen on exchanged sides in the brain;* but, *also, may be made to librate up and down, in contrary directions towards each other*, upon the principle of the *turned and reversed arms of the librating rod whose images appear thus reversed,* may afford a hint for the production of varieties; of which, some idea may be formed from viewing the *contending Image-arms*

of Fig. 2; the *sword of each cutting off the arm of its opponent, at every downward libration.* And, if the two objects on a card were made of *detached pieces, moving on a centre attached to the card by a thread;* the mechanism and effect might be much improved.

But, whatever fruits may be reaped from such devices on the score of *amusement,* or, even, of farther discovery; it must be strongly pointed out here, for philosophical consideration, that the PRINCIPAL delight they can afford, to persons of competent intelligence, is in the CONTEMPLATION OF THE FACT THAT HUMAN BEINGS, (and, of course, other animal beings, deducting however for their want of reason,) ARE THUS CONSTITUTED; *and that, by means of this Constitution, the* MIND, "IN ITS DARK CHAMBER THE BRAIN,"—(that dark chamber which has brought upon the immortal Newton such pointed ridicule, for his believing that it could contain any such images,)—continually, or from time to time, beholds,—IN IMAGES MADE OF SENSATIONS OF COLORS,—A FAC-SIMILE OF THE EXTERNAL UNIVERSE; or, at least, of a *certain extent* of it. This being a fact, established now by a great redundancy of proof in the Variety of the Phenomena; I shall close this Print by extracting a part of the concluding paragraph of the original paper.

The whole Series of Propositions, that constitute the little Treatise, which I ventured to call a *Rationale of the Laws of Cerebral Vision,* published previously to the Supplement now affixed, and this Supplement taken together, form one continued demonstration of the truth that, *Over and above the gift of Two External or Cranial Eyes,* man has, by his Adorable Creator, been endowed with an *Internal and Cerebral Organ which performs the office of a* THIRD EYE by being the *Common Recipient* of impressions, propagated either from one, or from both the Cranial Eyes. And that, the Mind, *in its presence-room, perceives by means of Images; and steers with regard to* External Objects on the same Principle as the Captain-

mariner, sitting below in his Cabin, perceives, by means of his *Mariner's Compass*, that his Ship is steering toward the Pole, or in any other direction.

STRICTURES

On the Abstract of the Paper on Recrossed Vision, printed by order of the Royal Society.

The Abstract, above entitled, after announcing the title of the paper in question, runs as follows.—"The "phenomena described in this paper, and which the "author designates those of *recrossed vision*, are cases in "which objects placed between and very near the eyes, "such as the two sides of the nose, appear on opposite "sides of the sphere of vision; the object on the right side "of the nose being seen to the left by the right eye, and "that which is on the left of the nose being seen to the "right by the left eye. These and other phenomena "illustrative of the well-known law by which we estimate "the position of objects with relation to the eye to be in a "line drawn from its image in the retina through the centre "of the eye, are considered by the author as requiring "farther explanation. Not satisfied with the theory of "Berkeley, that the mind is guided by the perceptions "received from the sense of touch, in interpreting the "signs furnished us by the sight, the author proposes to "explain these phenomena by an hypothesis of his own, "which he states in the following words." Here the abstract ends with a correct quotation of what I have said concerning the "*Cerebral* or *Third Eye*:" which, however, the functionary degrades by the title of an "HYPOTHESIS;" and which it certainly is if all the demonstrated dioptrical laws of light are to be called hypotheses. But, of this in the sequel.

DESIRING any thing rather than to comment with dissatisfaction, upon an abstract put forth under the sanction of the Royal Society; and, the more so, considering the Gentleman who communicated the paper thus reported, who, I am satisfied, has with punctilious honor discharged his duty to the subject in that, and in every respect; I find it nevertheless impossible, with justice to the Royal Society, to myself, or the science concerned, to refrain from stating the following remarks: because, besides every consideration of personal interests, it will appear that some very material, though secondary, features of Optical Science are at issue.

First, then, Laying aside that I had expressly mentioned the phenomenon of the "*duplicated nose*" as being *only the initial fact which served as a clue* to the far more impressive phenomena of the *recrossed coins*, and *recrossed syllables*, and *recrossed arms of the librating rod*; upon all which I placed the *principal* interest of the paper. And acknowledging, here, that the phenomenon of the *recrossed nose* is recognised with effective truth, with exception of the phrase—"*opposite sides of the sphere of Vision*;" I must remark that this phrase, although it expresses no fallacy, has certainly the *effect of concealing the fact that is vital to the subject*—namely—that the phenomena are recrossed IN THE BRAIN. For it is sufficiently known that not one of the disputants, concerning the *immediate organ of vision*, ever dreamed of assigning to that organ *any seat within the head*; and, therefore, whether the "*sphere of vision*" be taken to mean the *hemisphere of external objects* embraced at one time by the eye, or the *field of vision seen in consequence*, it is certain that no Optical reader could suppose that the expression—"sphere of vision"—means a sphere *in the brain*. The fact, therefore, is by that phrase concealed from the public; when a single word would have conveyed it to philosophers. To this I may be allowed to add that the subject is introduced, in the abstract, with *no word of connexion* acknowledging that it is new in KIND—

a department of science never before entered upon. And far less is there any hint given, that it had been attempted by Newton. In a word, the subject is slipped in, as if it were some very trifling increment of advance in a science already known; a procedure which, however, I mention chiefly as showing the *aspect* with which the thing has been looked upon, and which will appear more decisively from what follows.

When the abstract, after its manner of recognising the fact of recrossing, goes on to say—"These" (which means my own witnessed phenomena) "and other phenomena illustrative of the well-known law," &c.———"are considered by the author as requiring farther explanation;" the expression is an absurdity which could only have proceeded from the greatest negligence. Deducting, however, for the confusion in the passage; the meaning of the functionary, who composed it, is no other than to assert that my phenomena are "illustrative of the well-known "law by which we estimate the position of objects with "relation to the eye to be in a line drawn from its image "in the retina through the centre of the eye;" but that, *I consider that law as "requiring farther explanation."* What, then, will be thought when I declare that this assertion is an egregious mis-statement of *what I did expressly and at great length consider* in the Rationale, fully evinced in the paper in question?

Nothing is more certain than that, sometimes, a man's proofs, or arguments, are found to make against his theory. And, as the functionary assumes that mine do so, he was certainly entitled to assert this, though on the stake of his scientific responsibility. But when, in addition to this, he went on calmly to assert that *I consider the law in question as requiring farther explanation;* though it is one of the principal features of my labor to lay out a set demonstration, with varied illustrations, that the *principle is false and exploded;* I have no choice but to ask,—Is this the way in which a functionary of the National Scien-

tific Institute ought to use the power confided to him, to report with fidelity, and doubtless with some scientific knowledge, the contributions of men who have worked out their lives for the enlargement of science?—Is the misstatement not one that, to the readers of the Abstract, there strangles my refutation of the principle of the *line drawn?* In order, now, to show *what I did* consider; and, at the same time, show that *what I did consider is true science;* I state, in the first place, that the 19th and 20th propositions of the Rationale are laid out to demonstrate at great length, including its illustrations and adjuncts, that the principle of the *line drawn through the centre of the eye* is fallacious and altogether visionary. And I venture to believe, not only that this will never be disputed; but that, every philosopher, who reads that proposition, will admit it contains matter which claims his interest. It is, of course, impossible to do justice to the subject without referring to the two propositions in question; which are entitled thus:—"*Of External Direction, as a Principle Extraneous to Vision.*"—"*Of the Visual Principle of Coincident Images,—involving the Problem* How *the mind steers.*"—But the following extracts will serve the present purpose.—The refutation of the principle of the line drawn through the centre of the eye, I have stated as being *virtually the same* with Dr. Potterfield's principle of *a line falling* PERPENDICULARLY *upon the retina, at the point of impression.* And Dr. Reid has expressly acknowledged that they are nearly the same thing. And, in the conclusion of the proposition (the 19th) I have said—"As the last consideration which I shall adduce "here; it may be observed that, when we bend an eye "upon any field of vision; all the objects in that field, "which impress the eye at *any distance from the axis* of "the eye *greater than about a third part* toward the "pupil, must impress the retina with an *obliquity so* "*great,* that it is astonishing how any person could over-"look so obvious a fact. And yet, Dr. Reid not only

" avows Dr. Potterfield's principle of Perpendicularity, as " being a *connate or original law of the mind;* but also " says, he ' *honors him for the discovery.*' "

Here, however, by the way, if I recollect rightly, Drs. R. and P. are *opposed* with regard to the NATURE of this law: Dr. Potterfield considering it to be the result of the *line of direction of a ray of light:* whereas Dr. Reid has shown from experiments, with irresistible force, that, *in whatever direction* a ray falls upon the retina, we see an object *in the same direction, provided the* SAME POINT OF THE RETINA *be touched.* And this fact proves, with equal force, the truth of the Principle of Coincident Visual Images, here to be farther noticed.

To these references to the Rationale, I now add that, at this moment I am looking, with my right eye, at a chair in front of the eye; the image of which chair falls on the centre of the retina: And, at the same time, with the same eye, I see another chair, so far to the right (*nearly at a right angle*) that the rays of light coming from it *barely* enter the pupil, and *fall upon the retina of the eye with the greatest possible obliquity to it, and at a very little way* FROM, OR BEHIND, the outer edge of the *cornea.* Therefore it is certain that the line from the second chair, to its image on the retina, does not by a great distance, *pass through the centre of the eye:* And equally certain that it *does not* (as Dr. Potterfield thought) *fall* PERPENDICULARLY *on the retina.* If the functionary, who has staked his scientific reputation to the assertion that *my phenomena are* " *illustrative of the law of the line drawn through the centre of the eye,*" will refute this, and other such facts; I wish him all the success that the truth of science can afford him: and I should be happy, at the same time, to be favored with his name.

Having now stated nearly what may be sufficient, both as to *fact,* and to *science,* concerning the abstract; I here address every one, who would hold the Royal Society in respect; and ask,—After such a series of dioptrical

reasonings, confirmed by such ocular proofs, that Visual Impressions are recrossed in the brain ; Was it competent for its functionary to represent me as being *only* "*Not* "*satisfied with the Theory of Berkeley that the mind is* "*guided by the perceptions received from the sense of* "*touch, in interpreting the signs furnished us by the* "*sight ?*"—Was it competent for him to assert that I *only* "*propose to explain the phenomena by an hypothesis ;*" and, thus, to stigmatize my labor as a thing unproved, or doubtful? Or, Will the functionary commit his scientific judgment to an open demur, asserting that the impressions are NOT recrossed in the brain ; or that any other supposition makes against it ?—But, above all, Was it competent for the functionary mis-statingly to declare me as considering the *principle of the line drawn, &c.* "*as requiring farther explanation ?*"*—Was this the *fidelity,* any more than the enlightened liberality, or the scientific tact (*supposing the want of the last was real*), with which the detection of *Vision in the Brain, involving all its consequences,* was fit to be notified to Europe, by an Abstract under the sanction of the NATIONAL INSTITUTE of that Country in which Newton brought colors to light ?

When the case, (now in great part stated,) is considered in addition to that given in the Preface ; Let any ingenuous person pronounce, What course remained open to me, or to the subject thus obstructed, but an appeal, such as is here submitted ?

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* My words, in the paper to the Royal Society, are these :—"The Visual Principle of Coincident Images, which, I conceive, is rigorously demonstrated, and largely illustrated, in the 20th Prop. of the Rationale, and which involves a train of consequences," &c. Does the mis-statement, and consequent concealment of that announcement, not keep an important feature of the case out of sight ? And, What was the Cause of the imagined words that did this ?—Let the proper Judges decide. I judge it not, as I suppose the functionary can explain.

The Images change sides in the Brain.

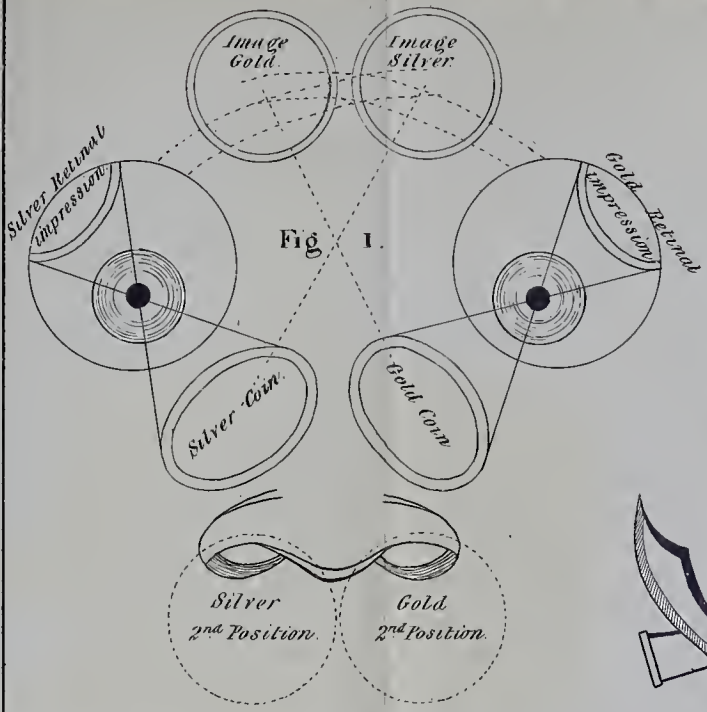
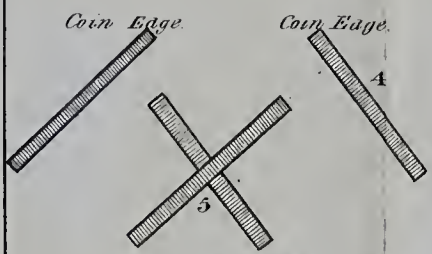


Fig 1.

The Image Arms reversed in the Brain.



The Coins, 3 & 4, cause the cross, 5 in the Brain.

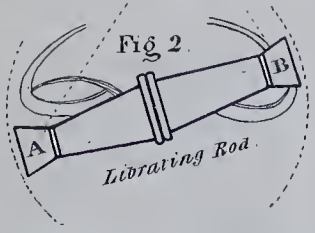
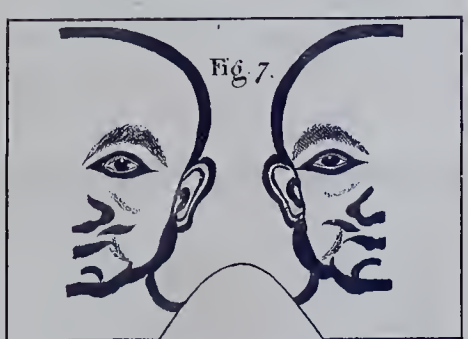


Fig. 6.

-bral.Cere-

Transposed in the Brain to Cere-bral.



Transposed in the Brain to a proper whole Face.

PLATE to illustrate Color Images in the Brain.

R Cartwright Lith.

OF COINCIDENT IMAGES

AS THE PRINCIPLE OF THE DIRECTION OF OBJECTS.

As the refutation of the supposed principle of the "*line drawn through the centre of the eye,*" constitutes only one half of the *desideratum* on the subject; And as the principle of *Co-incident Images* is that which I have laid out in the Rationale, in order to propose for it; I shall embrace this opportunity to add a gloss to the details of the matter as expressed in that Treatise, especially since it is proper, for the sake of those who may read this Supplement without the Rationale, to afford some notion of the Proposition which the Abstract, already considered, has, by its silence and opposition, nullified, as presenting not a point worthy of consideration against the principle of *the line drawn through the centre,* &c. No more, however, can here be attempted, than a *gloss:* For the proposition, with its various illustrations, occupies some space in the Rationale; and it must be referred to, in order to form any adequate conception of the whole principle.

The essence of the matter then is that, it having been demonstrated, throughout, that Visual impressions are recrossed in the head; it was thereby demonstrated that *there are* TWO FIELDS OF IMAGES employed in the process of vision—namely—a *field of* IMPRESSED IMAGES IN THE EYE,—and a *field of* COLOR IMAGES IN THE BRAIN. This being a fact proved beyond any attempt at denial; it followed accordingly—*that is it followed in an actual ocular induction of the fact,*—(which I have given at length in the place referred to,—) that *every point*

of the field of impressions in the eye, *corresponds* to *a point* in the field of Color Images in the brain: And, hence when, for example, any object impresses *a point in the middle of the retinal field;* this point COINCIDES with the *middle point of the field of Color Images:* And, when any point on the *extreme left of the retinal field* is impressed; this point COINCIDES with a point in the *extreme left of the field of Color Images:* And so on, throughout the whole field of retinal impressions. — In order to illustrate this PROVED FACT, I explain that, an impression in the retina of the eye is analogous to a *landscape cut in relief* upon a board placed *vertically in the eye;* and the *Color Images,* consequent upon this impression, are analogous to *the same landscape* PAINTED *upon a* SCREEN *placed behind, in the brain, and parallel to the board in the eye.*—If, now, I were to connect every image in the *forefield* with the correspondent image in the *after field, by lines of nerve,* or of *light;* of *ether,* or of *electrical matter;* either of these media might be no improbable thing: *but, the thing would be* "AN HYPOTHESIS;" and I challenge the Author of the Abstract to show that there is *any such hypothetical link, in the whole chain of the Rationale and the Supplement taken together.* But when, on the contrary, I assert *merely that there are* TWO FIELDS of images; *one in the eye, and another behind, in the brain;* I assert a MULTIPROOF FACT, and therefore I cannot but complain that it appears oppressive,* in a national functionary, to use his power to stigmatise a fact so proved, by calling it *an hypothesis.* The fact, however, being above controversy; and as all optical writers agree to call the retinal impressions "images;" while color images are certainly images; I have therefore called the

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* I say oppressive: because, *as few words* would have expressed, in the Abstract, (*at my proper hazard,*) my declaration that the thing in question is a *proved fact.*

principle in question the "*Principle of Co-incident Images.*" Accordingly, in the close of the paper presented to the Royal Society, I have repeated what was said in the Rationale; where I expressed it *as being the result of the whole continued series of proofs, first and last;* and which the Abstract has quoted, correctly indeed, but as a mere supposition which it appears to estimate light as air—namely that —" Over and above the gift of two external or cranial eyes, " man has been by his Adorable Creator endowed with an " *internal cerebral organ,* which performs the office of a " *Third Eye,* by being the common recipient of impressions " propagated, either from one, or both of the external eyes; " and that the mind, in her chamber of percipience, steers " with regard to external objects, by the same principle " on which the Mariner steers by his Compass. Thus, the " two cranial eyes are analogous, in principle, and situation, " to two Magnetic Compasses placed upon a ship's deck; " while the third, or Cerebral Eye, corresponds to another " compass placed in the cabin below: And the mind, si- " tuated like the captain mariner in his cabin, knows, from " consulting the Cerebral Eye, upon what point of direc- " tion the body is steering; although the Mind no more " perceives either any external object, or yet any image in " the cranial eye, than the mariner perceives, (even in the " vulgar sense of the word perceiving) the far-off land, or " haven, towards which he is surely making his way."

Upon this result, I now offer the following gloss: though I think it is already indicated in the Rationale.—Every Spectator of a scene *must allow*—(*and nature has well taught him how to do so*)—for the VARIATION OF HIS EYE, as the mariner allows for the *Variation of his Compass.* Thus, if a man know that his head is twisted far to the right, and his eye twisted far to the right in his head; he then knows that the object he sees is *nearly behind him:* And this he does on the very same principle that the mariner, when he is steering *North by his compass;* and knows that his Compass has "*Two Points*" of West Varia-

tion; knows that he is *not steering North*, but is steering "*North North West.*"

It was not to be doubted; On the contrary, it was altogether fit, that the scientific world should view with rigor a matter so little anticipated as this proved structure and office of the Brain; and should oppose it, accordingly, if room appeared for such opposition. But, as the supposed principle, of a *line drawn through the centre of the eye*, has been entertained by *Optical Philosophers in general*; (and accident might have made me, or any man, give into that opinion;) it is certain that *no one* philosopher need feel any particular reluctance to acknowledge its refutation. And it may be calculated that no liberal mind, so situated, will give into an unfounded and disingenuous opposition. I leave it now, without the least anxiety, that the *facts, when understood, and made at all familiar, are* TOO PLAIN AND HOMESPUN to admit of their being withstood. Nor have I met with any *express* opposition, or any sign of controversy, in any quarter; with exception of that virtual strangulation of the subject, in the silence and the otherwise-implied dissatisfaction of the Author of the "*Abstract:*" which dissatisfaction, I think, that Author will not follow out, under his name.

RECROSSED VISION WITH A SINGLE EYE.

In the Quarterly Review for July, 1831, there is an account of a Work by Dr. Abercrombie, "*On the Intellectual Powers:*" in which is recounted the affection of one, *and both*, of Newton's eyes, from a misuse of them in looking at the sun. This affection the author naturally conjectures is to be accounted for on the *principle of the decussation* of the optic nerves,—a conjecture not new, but *no proof* of which had been fallen upon until the detection of recrossed vision. But the Author in question, as

others have done before him, supposes that the MEDIUM by which the *second* eye becomes affected, in consequence of a visual derangement of the first, is SYMPATHY. Now, as this conjecture, of a visual principle of sympathy, has thus been adverted to in a channel of such extensive circulation and influence as the QUARTERLY REVIEW: and this, too, about the time of my publishing the detection of recrossed vision: it appears requisite that I should say a few words here, in order to show that the principle of sympathy is out of the question in producing the recrossing of images; and this, not with a view to the Author in question; but to prevent its proving a stumbling-block, in the subject, to any reader, of any part of it.

First, then, The recrossing and rectifying of the images within the head is a fact proved to be *mathematically necessary*, through a series of dioptrical propositions; and is *afterwards proved to be real*, by full *ocular demonstration*. And, besides these combined proofs; I urge that, upon inspecting Figure 7 in the plate, it is conclusive that *sympathy, if it existed*, could only make the optic nerve of the *second* eye produce *another half face, a copy of the half face seen by the first eye;* and it could never produce a *proper whole face*, as we see it does. This fact is so conclusive that, I feel confident, no philosopher of name will place himself in the situation of denying it.—Again, in the phenomenon of the *Librating Rod;* SYMPATHY could *not reverse the arms of the image rod:* and, far less could it make the reversed arms *move up and down, in contrary directions, passing and repassing one another*. It would be an affront, to the understandings of optical adepts, to enlarge upon such proofs of the fact that visual impressions are recrossed and rectified *by a mechanism and structure of the nerves, purposely contrived* for this recrossing.

But the subject *does not admit* of my stopping here: For the proofs, now adverted to, form in fact but *one half, or one species*, of the existing proofs of the matter in

question: because the 22d Proposition of the Rationale is laid out under the following title—namely—"*In the "case of Vision with a Single eye, the Retinal Images of "Objects are recrossed, after their inverted formation on "the Retina, and are made erect posterior to that* eye." And, in that proposition, illustrated by the first Plate, figures 3, 4, 5, 6, 11, it is *demonstrated* that the *duplicated pin's head*, seen with one eye; and the *interlaced edges of* the *two* coins;—and the *interlaced ribs of the leaf*;—are, all of them, *facts of recrossed vision with a single* eye. It hardly needs be said that no one will ever pretend to attribute this recrossing, *in the single eye*, to SYMPATHY; or, *deny it to* MECHANISM.

Finally here: Upon this function of the Single Eye, *or Trunk*, to recross its own impressions, I offer a hint to *philosophical anatomists of the brain,—a mere conjecture*,—which I utter only because I am by various causes prevented from working farther on the subject; (IN WHICH, HOWEVER, MUCH REMAINS TO BE DONE;)—namely—that the *retinal impressions are recrossed* IMMEDIATELY ON THEIR EXIT *from the eye to the optic trunk,—perhaps in the button,*—and are *rectified, at once, in the trunk*, forming an IMPRESS IMAGE IN LITTLE;—which impression travels along the optic trunk, and is *re-expanded previously to its discharge* upon the perceiving mind. I shall not offer a word here, in support of this conjecture: *which,—and which only* in the present labor,—the functionary of the Abstract is welcome to refute *as an hypothesis;* though I offer it here *only as a mere conjecture, in order to stimulate research.* It is at the same time certain that, *this;* and the MANNER, *and the* PLACE, of the CORRESPONDENCE OF THE RECROSSING *when* BOTH *eyes are employed*, are very beautiful problems; and the last a most important one; to be solved.

It cannot be doubted, by those who have read this statement, that any man, of competent knowledge, and high feeling, who has, from haste, or negligence, mis-stated my

labor, or miscalled the subject; and has seriously impeded its reception, by representing it as at best questionable, and in part contradicted; will be anxious to explain the matter, for his own honor, and for the advancement of science. While I announce, (and this with no feeling but a desire that right be done,) that it is equally my duty and my determination to remove this obstruction, by doing what I had hoped the Royal Society of the Country, if not other Scientific Organs, would have done for me, in placing this Supplement and Case in such channels as must find for them the adjudication of Europe. In so doing; the first appeal is, of course, due to the Royal Society.—And I now respectfully beg to lay the matter before His Royal Highness the President, and the Council of that illustrious body; with the hope that, in its wisdom, it will extend protection to, and not suffer any accident drive the Science of Vision within the Head, to owe to the philosophers of a foreign land for that first public recognition which ought to belong to its native country.

N.B.—*The Paper, presented to the Royal Society, is dated September 8th,* 1830:—*And this Supplement is published September 26th,* 1831.

OMISSION IN PAGE 36.

Where it is said—"a conjecture not new, but *no proof* of which had been fallen upon until the detection of recrossed vision,"—it ought to have been added,—*Nor is any proof* of the matter afforded by recrossed vision: because, it seems even a much more probable conjecture that *each optic trunk carries its own* impressions on *beyond the meeting* of the two trunks; and perhaps expands *each in its own* THALAMUS; in the *thick mass* of which last it *may be* that the retinal impressions of its own eye are *recrossed.* For this reason, the two *Image Coins* of Fig. 1., which *appear* as if recrossed *by the crossing of the nerves,* may not be truly represented: though this could not be helped in the present state of the subject.

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ADDITIONAL PHENOMENA WITH ONE EYE.

ALTHOUGH it is manifest that the adaptation of the Single Eye, or of its Optic Trunk, to recross, and rectify its own retinal impressions, is most important, and altogether vital in the Machinery of Vision within the Head, inasmuch as that adaptation constitutes *one half* of the Visual Mechanism when we see with *both eyes*, and ABSOLUTELY THAT WHOLE *Mechanism as often as we see with* ONLY ONE EYE; I had considered this function of the single-eye so completely demonstrated in the 22nd Prop. of the Rationale, as not to have afforded it an after-thonght. But, in adverting to this function in page 38 of the present Supplement, it occurred to me that the demonstration of the recrossing of the two *image-pins' heads* (however certain) constitutes a rationale of considerable dioptrical subtilty, it having escaped the research of Drs. Reid and Potterfield; and as, at the same time, the facts of recrossing in the case of the *two contacted coin edges*, and of the *ribs of the leaf*, being facts of *very minute subjects;* it would be desirable, if we could demonstrate the fact upon a *larger and more obvious scale*. Upon this, it struck me to try an experiment; which I am now greatly surprised I could have omitted before, but which omission certainly arose from my feeling of security on the phenomena already adverted to. The simple artifice, whose result I now announce, is that, upon trying *throbbing pressures on the opposite sides of the ball of the* SINGLE EYE, I had the instant gratification of seeing TWO PEACOCKS' FEATHERS, *on the opposite sides of that eye:* And, upon making the *throbbings change their places, all round the eyeball, the two circular objects constantly obeyed the law of recrossing;* the *throbbing on the right* side producing the *object on the left* in the eye; while the *simultaneous throbbing on the left* produced the *object on the right;* precisely as happens in the case of the similar process performed upon BOTH EYES, as already duly described.

It has appeared to me that, so broad, and obvious, and even popular, a species of proof of the recrossing functions of the Single Eye, ought not to be withheld on the present occasion, since it so remarkably establishes the Mechanism of Vision within the Head.

If, as is certain, the adorable wisdom of the Creator is eminently displayed in the mechanism of the *Eye itself*, including both its dioptrical and its nervous apparatus; How vastly is the display of that wisdom magnified, and multiplied, in the single, and the double, mechanism within the head; in which, *by the medium of marrow cords*, the impressions of one, and of both eyes, are made to *recross*, to *rectify*, and to *harmonise!!!*

ILLUSTRATIONS OF RECROSSED VISION.

THE following extracts from a Paper in the Transactions of the Royal Society, by Dr. Wollaston, in 1824, "*On Semi-decussation of the Optic Nerves*," afford so remarkable and complete a confirmation of Recrossed Cerebral Vision, that I deem it of essential moment to add this evidence to the arguments set forth in the present Letter and in my preceding publications on the subject.

Describing an instance of blindness to *one half of the field of vision* which had occurred to himself a *second time;* he says:—"The blindness was first observed, as before, "in looking at the face of a person I met, whose *left* eye "was to my sight obliterated. My blindness was in this "instance the reverse of the former, being to the *right* "(instead of the left) of the spot to which my eyes were "directed; so that I have no reason to suppose it in any "manner connected with the former affection."

He afterwards says:—"It is plain that the cord, which "comes finally to either eye under the name of optic "nerve, must be regarded as consisting of two portions, "one half from the right *thalamus*, and the other half "from the left *thalamus nervorum opticorum*. According "to this supposition, decussation will take place only be-"tween the adjacent halves of the two nerves: That por-"tion of the nerve which proceeds from the right *thala-"mus* to the right side of the right eye passes to its desti-"nation without interference; and in a similar manner "the left *thalamus* will supply the left side of the left eye "with one part of its fibres; while the remaining halves "of both nerves, in passing over to the eyes of the oppo-"site sides, must intersect each other, either with or "without intermixture of their fibres."

In fine. In relating his friend's case, Dr. Wollaston says:—"In this case the blindness was at the time, and still is, "entire with reference to all objects situated to the right "of his centre of view."—"He sees what he writes, and "the pen with which he writes, but not the hand that "moves the pen. This affection is, as far as can be ob-"served, the same in both eyes, and consists in the insen-"sibility of the retina on the left side of each eye."

Upon these recorded actual phenomena of *Half-field Vision,* I shall at present only remark that, if Dr. Wollas-

ton again illumined the world, and I could command him to FEIGN a set of cases in order to confirm Recrossed Cerebral Vision, I could not choose any case more completely in *juxtaposition* with the whole Rationale and phenomena laid out in my several publications on the subject: For, when we press (for example) simultaneously on the *left side of each Eye*, we have TWO *Peacock's Feathers on the right side of the Sensorium*, ONE of them being *more to the right* than the other. Can any force of bias resist this fact, when it is taken in combination with Dr. Wollaston's case of *Half-field Vision*?—The fact of its happening on DIFFERENT SIDES OF THE FIELD OF VISION *at two different times*, renders it an *experimentum crucis* of a very rare value and occurrence.

TWO remarks, of material importance, had not room for insertion in the body of the Letter. *First.*—ALL NOVICES, (as happened to Sir Isaac Newton, as well as to myself,) have thought with Sir David Brewster that the Peacock's Feather is *in* the opposite MARGIN OF THE SAME *eye that is pressed.* Nor, perhaps, would the cheat be discovered so long as we employed but ONE eye. It is *only upon bringing* BOTH eyes into action that the grand secret of the recrossing is revealed, in all its manifest certainty and consequences.

SECONDLY.—The Advocates of *External Direction* may, still, think it *something* that the Peacock's Feather is *always true to the opposite point of the* EYE to the point impressed: and they may, perhaps, demand a REASON for this. But the wonder must cease when I point out that, the *reason* is because the EYE *and the* SENSORIUM *are*, EACH *of them*, SPHERICAL; so that a PRESSURE (for example) *on the* EXTREME LEFT *of the* LEFT EYE *occasions a* FEATHER *on the* EXTREME RIGHT *of the* SENSORIUM; *which must be, since the* TWO SPHERES *are* TWO CO-OPERATING ORGANS, the PRESSURES *on the* EYE *being* REGISTERED, AS COLOR IMAGES, *no where but* IN THE SENSORIUM.